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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,004	04/17/2001	Masataka Kondo	81846.0026	1067

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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/837,004

Applicant(s)

KONDO ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8,9 and 11-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8,9 and 11-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/531,549.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Claims 8, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,370,356 to Bok et al. in view of U.S. Patent No. 5,762,749 to Suzuki et al.
4. Bok et al. disclose an apparatus for manufacturing a semiconductor device having a thin film on a substrate substantially as claimed and comprising: a washing section (see Figure 4, step 1) for washing the substrate with a washing liquid; a liquid removing section for removing the washing liquid from the substrate by blowing compressed air to the substrate washed (see Figure 4, step 2); and a film forming section (see Figure 4, step 4) for forming a thin film on the substrate from which the washing liquid has been removed.
5. However, Bok fails to teach the liquid removing section as capable of removing a washing liquid from the substrate by blowing pre-heated compressed air to the washed substrate, wherein the liquid removing section has an air knife that is inclined in a first direction that is horizontally perpendicular to a transfer direction of the substrate and inclined in a second direction that is vertically perpendicular to the transfer direction of the substrate so as to blow compressed air towards a rear edge of the substrate.

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6. Suzuki et al. disclose the liquid removing section as capable of removing a washing liquid from the substrate by blowing pre-heated compressed air to the washed substrate, wherein the liquid removing section has an air knife that is inclined in a first direction that is horizontally perpendicular to a transfer direction of the substrate and inclined in a second direction that is vertically perpendicular to the transfer direction of the substrate so as to blow compressed air towards a rear edge of the substrate for the purpose of efficiently removing cleaning liquid from the upper surface of the substrate (Figures 7 and 8; column 2, rows 17-25; column 7, rows 18-26; column 10, row 66 through column 11, row 23).

7. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an air knife blowing pre-heated compressed air to the washed substrate, wherein the air knife is inclined in a first direction that is horizontally perpendicular to a transfer direction of the substrate and inclined in a second direction that is vertically perpendicular to the transfer direction of the substrate so as to blow compressed air towards a rear edge of the substrate in Bok et al. in order to efficiently remove cleaning liquid from the upper surface of a substrate as taught by Suzuki et al.

8. With respect to claim 9, the washing section of Bok et al. comprises a brush washing section, a rinse section and an ultrasonic washing section in which the substrate is washed.

9. With respect to claim 11, as noted above, Suzuki et al. teaches providing a heater for heating compressed air to be supplied to the air knife (column 7, rows 22-26).

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bok et al. and Suzuki et al. as applied to claims 8, 9 and 11 above, and further in view of U.S. Patent No. 6,406,541 to Cairncross et al.

11. Bok et al. and Suzuki et al. disclose the invention substantially as claimed and as described above.

12. However, Bok et al. and Suzuki et al. fail to teach the apparatus comprising an ionizing section for ionizing compressed air supplied to the air knife.

13. Cairncross et al. teach the use of an ionizing air knife for the purpose of neutralizing electrostatic charges (column 1, rows 54-55 and column 16, rows 10-15).

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14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an ionizing air knife in Bok et al. and Suzuki et al. in order to neutralize any electrostatic charges present on the substrate as taught by Cairncross et al.

15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bok et al. and Suzuki et al. as applied to claims 8, 9 and 11 above, and further in view of U.S. Patent No. 4,017,982 to Goffredo.

16. Bok et al. and Suzuki et al. disclose the invention substantially as claimed and as described above.

17. However, Bok et al. and Suzuki et al. fail to teach the liquid removing section has at least two air knives located above and below the substrate to be transferred arranged such that the closest ends of adjacent air knives are spaced apart at a predetermined interval in the substrate transfer direction and overlap for a predetermined distance in the direction perpendicular to the substrate transfer direction.

18. Goffredo teach the use of a plurality of heated air knives located above and below the substrate to be transferred, inclined to the direction perpendicular to the substrate transfer direction and arranged such that the closest ends of adjacent air knives are spaced apart at a predetermined interval in the substrate transfer direction (horizontally adjacent air knives in Figure 1) and overlap for a predetermined distance in the direction perpendicular to the substrate transfer direction (vertically adjacent air knives in Figure 1) for the purpose of removing a liquid film from a substrate(see abstract).

19. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided knives arranged as described above in Bok et al. and Suzuki et al. in order to remove a liquid film from a substrate as taught by Goffredo.

20. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bok et al. and Suzuki et al. as applied to claims 8, 9 and 11 above, and further in view of U.S. Patent No. 5,769,952 to Komino et al.

21. Bok et al. and Suzuki et al. disclose the invention substantially as claimed and as described above.

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22. However, Bok et al. and Suzuki et al. fail to disclose a load lock chamber for heating the substrate to a predetermine temperature before the film is formed in the film forming chamber.

23. Komino et al. teach the use of a load lock chamber for use before a film forming process for the purpose of shortening the heating time required to reach a treatment temperature (column 7, rows 10-32).

24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a load lock chamber for heating a substrate to a predetermined temperature before a film is formed in the film forming chamber in Bok et al. and Suzuki et al. in order to shorten the heating time required to reach a treatment temperature as taught by Komino et al.

25. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bok et al. and Suzuki et al. as applied to claims 8, 9 and 11 above, and further in view of Japanese Patent 02-019470 A to Fujioka.

26. Bok et al. and Suzuki et al. discloses the invention substantially as claimed and as described above.

27. However, Bok et al. and Suzuki et al. fail to teach depositing a film using a first pipe for supplying a material gas and a second pipe for supplying an inert gas, which is ionized into a plasma before a film is formed in the film forming chamber.

28. Fujioka teaches using a first pipe (Figure 1, 111) for supplying a material gas and a second pipe (105) for supplying an inert gas, which is ionized into plasma for the purpose of enabling the formation of a deposition film having quality and for the purpose of obtaining the film with good efficiency (abstract).

29. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a first pipe for supplying a material gas and a second pipe for supplying an inert gas which is ionized into a plasma in Bok et al. and Suzuki et al. in order to enable the formation of a deposition film having quality and in order to obtain the film with good efficiency as taught by Fujioka.

Response to Arguments

30. Applicant's arguments with respect to claims 8-9 and 11-14 have been considered but are moot in view of the new ground(s) of rejection. New art has been cited and used in the above rejections of the

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newly amended claims to account for the recitation (i.e. an air knife that is inclined in a first direction that is horizontally perpendicular to a transfer direction of the substrate and inclined in a second direction that is vertically perpendicular to the transfer direction of the substrate so as to blow compressed air towards a rear edge of the substrate) not taught in Bok et al. or the other pieces of prior art.

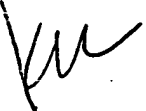
Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,073,369 and U.S. Patent 6,528,425 both disclose inclination of an air knife in a first direction that is horizontally perpendicular to a transfer direction of the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore
Patent Examiner
Art Unit 1763
30 May 2005